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CORN MEAL AS A FOOD AND WAYS OF USING IT.

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INTRODUCTION.

The intelligent use of a given food material, such, for example, as Indian corn, which forms the subject of this bulletin, calls for some knowledge of its nature, properties, and food value, and also some understanding of the possibilities of its use as compared with other foods which make up the ordinary dietary. The increasing variety of foods at the disposal of the housekeeper, resulting from improved methods of agriculture and marketing, from more extended food manufacture, and from the introduction of new foods is contributing pleasing and healthful variety to the diet. It also offers a temptation to complicate the diet to a degree undesirable from the point of view of either health or economy of time. In the face of this temptation intelligent housekeepers and those who cater wisely for larger groups of people, in schools or other institutions, are seeking to secure the advantages, without the disadvantages, of the large number of available foods which include the old and well tried as well as the new.

If the meals of the average family are analyzed, each will be found to contain one or more foods—meat, fish, poultry, cheese, or a legume—distinguished from others by a high percentage of tissue-forming material; one or more foods distinguished from others by a high percentage of fat—butter, oil, or cream; and one or more foods—bread perhaps, or potato, or rice, or a prepared cereal—distinguished from others by a high percentage of starch. This by no means exhausts the groups, but it goes far enough to suggest how a meal is usually made up and also to point out that variety can be secured in two ways, either by multiplying the representatives of the various groups in each meal (serving fish and meat in the same meal, for example, or potatoes and rice), or by limiting the representatives of each group and varying them from meal to meal. By the latter means variety would be secured through a succession of simple meals differing among themselves. The choice between the two methods

must be determined to a large extent by the needs and tastes of the family or group for which the catering is done, but there can be no doubt that there is a tendency toward simplifying the individual meal and toward varying what we may call the "constants" from meal to meal or from day to day. In order to do this, a person must understand the various foods sufficiently well to be able to group them on the basis of their special uses.

It does not necessarily follow that multiplying the representatives of any given group means that one overeats of this group. With potatoes, rice, and sweet potatoes at the same meal, one would probably eat little more of all together than he would of one alone. He would surely secure more varied and well selected meals if vegetables of different types were served with one carbohydrate food instead of three carbohydrates at the same time. The assumption sometimes made in popular literature that the body is harmed by having several sorts of starch, for instance, supplied at any one meal, like other such statements, apparently has no foundation in fact.

The purpose of this bulletin is not to recommend Indian corn to the exclusion of other foods of its group, the cereals, which include wheat, rice, rye, and others, but to speak of its value as a food and its distinguishing qualities which call for special methods of cooking, and to show how it may be used to secure variety in one of the principal lines of food materials which make up the usual dietary.

ORIGIN OF INDIAN CORN.

Indian corn has special historical interest for Americans from the fact that it is generally recognized as being native to American soil. It was originally a tropical or subtropical plant, but the Indians, though unconscious of the trend of their attempts to extend corn growing, nevertheless succeeded in evolving varieties which would ripen as far north as Canada. Its cultivation and use, therefore, even in the early days were very widely distributed in America. With fish and game it made the staple food of the Indians, and except for wild rice, which grew abundantly in shallow fresh waters, and the seeds of certain wild grasses (both used in relatively small quantities), it was the only cereal known to them.

In all the history of America corn has played an important part. The desire to produce it was probably the incentive which most frequently led the Indians to abandon nomadic life and to form settlements. Because of the quickness and ease with which it can be raised, it was doubtless, too, the means of saving from starvation many of the pioneers who came from other lands to settle here. So important was this food in the days when the country was being settled, that both Indians and colonists in their controversies often found it more

efficacious to destroy the corn crops of their adversaries than to make open war upon them.

After the discovery of America the use of corn spread rapidly to other countries, and it is now very generally raised in all regions of the world where it will flourish. So generally has it come into use that it now ranks with wheat, rye, barley, oats, and rice as one of the food grains of the world and may be called the American Indian's greatest gift to modern civilization.

COMPOSITION OF CORN.

A previous publication of this series ¹ discusses at length the composition of corn and corn meal, corn breakfast foods, cornstarch, and other food products prepared from this grain, and this need not be considered in detail here. Some data of this sort are, however, briefly cited, since they have a bearing on problems of cooking corn meal and using it economically.

The table which follows shows the average composition of corn grain of different sorts and corn meal of different kinds:

Average composition of corn and corn-meal products.

Kind of material.	Water.	Protein.	Fat.	Carbohydrates.		Mineral matters.	Fuel value per pound.
				Starch, sugar, etc.	Crude fiber.		
	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Calories.</i>
Corn, whole grain, average....	10.8	10.0	4.3	71.7	1.7	1.5	1,795
Corn, white.....	11.4	10.8	5.0	68.8	2.5	1.5	1,690
Corn, yellow.....	11.9	10.7	4.8	68.9	2.2	1.5	1,690
Corn meal (whole grain ground), unbolted.....	12.0	8.7	4.7	71.1	2.2	1.3	1,850
Corn meal (whole grain ground), bolted.....	12.0	8.9	4.9	72.0	1.2	1.0	1,765
Corn meal, granulated (new process).....	12.5	9.2	1.9	74.4	1.0	1.0	1,770
Corn flour, i. e., finely ground and bolted corn meal.....	12.6	7.1	1.3	77.5	.9	.6	1,645

On the basis of very numerous studies it can be stated that the different varieties of corn differ little among themselves in nutritive value, and that when fully ripened and matured the corn crops of various parts of the world are practically identical in composition. The average composition of corn refined and dried for grinding is given as follows: Water, 10.8 per cent; protein, which is of special interest because it is the nutrient which builds and repairs the tissues of the body, 10 per cent; fat, 4.3 per cent; starch and sugar, which with fat are the chief sources of energy, 71.7 per cent; crude fiber, 1.7 per cent; and mineral matter, 1.5 per cent. The fuel value, or, as it is often called, the energy value, is 1,795 calories per pound. When

¹ U. S. Dept. Agr., Farmers' Bul. 298.

this composition is compared with the average composition of the common foodstuffs which make up the diet of the majority of people—meat, dairy products, vegetables, fruits, etc.—it is found to have a low water content, a low fat content, a fairly high protein content, a very high percentage of carbohydrates (chiefly starch), and very close to the average amount of mineral matter.

Few people wish to remember the composition of foods exactly, but many, particularly housekeepers and others who are interested practically in the food supplies of families or other groups, wish to keep in mind in a general way the composition of the foods which they handle. For such people it will be sufficient to think of the composition of corn in terms of tenths: Seven of the tenths being starch; one, protein; one, water; and the other tenth being divided among fat, crude fiber, and mineral matter in approximately equal amounts.

COMPOSITION OF CORN COMPARED WITH OTHER CEREALS.

A detailed comparison¹ of the composition of Indian corn and other cereal grains (wheat, rice, oats, rye, barley, Kafir corn, millet, and buckwheat) shows that these cereals differ little among themselves in composition—so little, in fact, that save where great exactness is sought they can be considered as a group of interchangeable foods so far as their nutritive value is concerned. The average percentage of protein in them is 11, the extremes being 8 and 13 per cent. Indian corn, which has on an average 10 per cent protein, falls slightly below the average for the group. Its fuel or energy value, on the other hand, is the highest of all the cereals included in the list, being approximately 1,800 calories per pound, or about 100 calories above the average. An explanation of this is found in the percentage of fat, which is 4.3 per cent, the average in the cereals being about 2.5 per cent.

WHITE AND YELLOW CORN AND CORN OF OTHER COLORS.

As regards color, there are many varieties of corn—white, yellow, red, blue, and black. There is also some difference in the flavor of the different sorts, but, contrary to common belief, these varieties are, on the average, practically identical in composition, and differ little in nutritive value. White corn meal is, as a rule, milder in flavor than yellow. The preference for one sort or another, however, is a personal matter, and seems to be determined very largely by locality. White corn is generally preferred in the Southern States and in Rhode Island and yellow in the Northern States as a whole, while the blue, black, and red have always been used very largely in the Southwest, where Spanish influence is marked.

¹ U. S. Dept. Agr., Farmers' Bul. 298.

CORN MEAL.

Changes in modern milling methods, with corresponding differences in the characteristics of corn meal, have given rise to the terms "old-process meal" and "new-process meal." As is the case with wheat flours, the character of the meal is largely influenced by the amount of the different parts of the grain retained in it.

A grain of corn is by no means uniform throughout in composition, but is made up of many parts differing greatly among themselves, not only in texture and consistency, but also in chemical composition. In general, it is sufficient to consider the kernel as consisting of three parts—skin, germ, and endosperm. The skin constitutes about 6 per cent of the whole weight of the kernel; the germ, which contains the embryo from which under favorable conditions new life will spring, about 10 per cent; and the endosperm, which is the storehouse of food for the new life, about 84 per cent.

An idea of the differences in composition of the different parts may be gained from data obtained with one variety of corn, but which can be regarded as typical. According to these figures the skin contains approximately 5.5 per cent protein; the germ, 15.3 per cent; and the endosperm, 9.2 per cent. In the case of fat the skin contains 1.4 per cent; the germ, 20.8 per cent; and the endosperm, 1.1 per cent. The percentage of sugar and starch (chiefly starch) in the skin is 62.8; in the germ, 31.5; and in the endosperm, 84; and the percentage of crude fiber 13.9, 2, and 0.5, respectively. To put the matter in another way, the skin contains 51 per cent of all the crude fiber in the kernel, the endosperm contains 90 per cent of all the starch, and the germ contains 16 per cent of the protein and 65 per cent of the fat. Removing the whole skin, therefore, would take away only six one-hundredths of the whole weight of the kernel but more than half the fiber. This would, of course, leave the remaining portion of the grain with a much smaller percentage of fiber than the kernel had originally. When the germ is removed, as it often is, by modern milling processes, the effect is to take away only one-tenth of the whole weight of the kernel but more than six-tenths of all the fat and one-sixth of the protein. It will be seen, therefore, that the removal of the skin and the germ would tend to reduce materially the percentages of cellulose and fat and somewhat the percentage of protein in the meal.

METHODS OF MILLING.

In order to soften the ripe, dry corn sufficiently to make it edible it has always been found necessary to crush it, the grain being sometimes parched or soaked so it would crush more easily. This was in the early times accomplished by pounding in a hollow log or by means of stones. Under most primitive conditions these stones were

manipulated by hand. Later they were turned by water power, and the meals produced in this manner are called "water ground."

When the whole grain was crushed the resulting meal contained, of course, all of the skin, much of which is hard and unsuited for food. A second step in producing an edible and palatable product, therefore, was the removal of the bran so far as possible. This was done in early times by means of sieves and similar devices, or by winnowing, but the removal was far from complete, and the resulting meal did not differ greatly in chemical composition from the original grain; it was simply more convenient for use.

The removal of the bran by these primitive methods was somewhat wasteful, for much of the interior of the grain was also removed. Of late a method has been devised for kiln-drying the grain, after which the skin can be removed in one piece.

The fat in the germ, which when separated is called corn oil and is used in many ways in the arts and for culinary purposes, is peculiarly liable to become rancid. For this reason the older types of meal, which contained all the germ fat, were hard to keep in good condition. Modern milling processes, which substitute steel rollers for stones, flatten the germ without breaking it, thus making it possible to remove it whole. The effect of the removal of the skin and germ, as we have said, is to reduce quite materially the percentages of fat, cellulose, and mineral matter, and to some degree the percentage of protein. The removal of the germ, however, and the kiln-drying of the meal, which lessens or destroys molds and decay-producing bacteria, are not without their advantages, for they have the effect of improving the keeping quality of the meal.

USES OF CORN MEAL.

Data obtained in the nutrition investigations¹ of this department show that over 60 per cent of the food consumed by the people of the United States, on an average, is of vegetable origin, and that about one-seventh of this, or 8.7 per cent of the whole, is corn meal. Of the total protein consumed, animal as well as vegetable, corn meal supplies 10 per cent; of the total fat, 3.8 per cent; and of the total carbohydrates, 13.7 per cent.

Corn meal compared with other foodstuffs of a similar nature is a low-priced food material, and when used alone or with other equally low-priced foods makes economical dishes. Of these dishes, which consist often of meal, salt, and water only, each locality where corn is used in large amounts seems to have worked out its own peculiar form. The southern cook made hoeecake, or corn pone or ash cake, cooking a dough of corn meal and water on a board before an open

¹ U. S. Dept. Agr., Office Expt. Stas. Circ. 110.

fire, or baking it in the ashes. The early New Englander had his "hasty pudding," made by cooking corn meal in a large amount of water. This was so made that when hot it was thin enough to be eaten as a mush with milk, and when cold thick enough to be fried in slices. The Italian has his polenta, which resembles hasty pudding, except that it is usually somewhat thicker and that a little fat is added.

RELATION OF CORN MEAL TO THE BALANCED RATION.

As the science of nutrition has developed, a term, "nutritive ratio," has been devised and used in the discussion of foods, of meals, and of dietaries. This refers to the ratio of protein to the other constituents present as sources of energy. The farmer has found a consideration of nutritive ratio of value in discussing his feeding problem, and it is equally useful for the housekeeper. When this is understood it is less easy to fall into a popular error and speak of protein as a tissue-forming substance, and of fat, sugar, and starch as fuels. The truth is that protein, too, is a fuel, and when taken into the body and utilized produces almost the same amount of heat, weight for weight, as either sugar or starch. Besides its power to produce heat, however, protein has another and most important use, which the fats and carbohydrates can not serve—that of providing nitrogen for building and repair material for the body tissues. It is often desirable to distinguish protein from the other nutrients, and this may be conveniently done by stating how much of the heat represented by a given food is provided by the tissue-forming substances and how much by those without nitrogen which serve as fuel. Such a statement is furnished in what is called the nutritive ratio. If the nutritive ratio of a food is stated as 1:6, we may understand that the fuel from the nitrogenous part of the diet available for tissue forming is one-sixth of that from the fats and carbohydrates.

The nutritive ratio of the ordinary diet of a person doing moderate muscular work is not far from 1:6, while the nutritive ratio of corn meal is about 1:10. In the well-balanced dietary, therefore, corn meal would naturally be combined with foods of higher nutritive ratio—with milk, meat, fish, eggs, or cheese, for example. That the tendency toward taking balanced rations is more or less instinctive is indicated in the case of corn meal by the fact that almost every locality which uses this food material in large amounts has a characteristic dish in which corn meal is combined with a substance richer in nitrogen. Probably the best known of these dishes in this country are succotash—in early times made of dry corn and beans as well as of the green—and the mush and milk of the earlier settlers of New England, and the hoecake and buttermilk of the South. It was the custom of the American Indians in early times to combine corn meal with the fish and meat which they brought back from the chase. It is said that they used for this purpose shad, eel, alewife, and other

kinds of fish and the flesh of deer, beaver, bear, moose, otter, and raccoon. While it is obviously impossible to give the exact nutritive value of foods which vary in composition as both corn meal mush and milk must necessarily vary, it is safe to say that equal volumes of corn meal mush and milk form a ration which satisfies very nearly the physiological requirements of the body as these are understood to-day.

Another apparently instinctive attempt to secure a balanced ration is the dish known as "scrapple," for which a recipe is given later in the bulletin. This is made by cooking corn meal in the water in which pork (usually a pig's head) has been boiled and combining this mixture with the finely chopped pork. The addition of the meat, which consists largely of protein and fat, to the corn meal, of which starch is a prominent ingredient, tends to produce a balanced ration. "Stamp and go," a favorite dish among the natives of Jamaica, is made up of salt fish, lard, and corn meal, and has a nutritive value resembling that of scrapple. The use by the Italians of cheese, which consists chiefly of protein and fat, with a sort of mush called polenta, may be considered another instinctive attempt to satisfy the physiological food requirement by means of a single dish.

COMBINATION OF CORN MEAL WITH MORE HIGHLY FLAVORED FOODS.

All those who use corn meal in large quantities have apparently sought also to combine this neutrally flavored food with others of pronounced flavor. The Zuni Indians have a dish which is called "hot cakes" which they make by combining corn meal with water and suet and adding a large amount of red pepper. In the United States it was a common custom in older times to vary many of the corn-meal dishes by the addition of tart apples (see p. 20), while in Italy polenta is usually served either with a highly seasoned sauce or with cheese.

THE COOKING OF CORN MEAL.

A study of the modifications in methods of cooking, which have been rendered necessary by the changes in the composition of the meal, was made a few years ago at Teachers College, Columbia University, New York City, for the Office of Experiment Stations. The result of these investigations, which are still unpublished, may be summarized as follows:

In general it was found that about 10 per cent more water was needed for the new-process meal than for the old process, and that where the large amount of water used renders the meal liable to sink, the mixture of meal and water should be thoroughly heated

before being used for such preparations as bread. In some cases, too, it was found best in using new-process meal to pour the meal into a dish of boiling water instead of pouring the boiling water over the meal in a cold dish, for this brings the mixture to a higher temperature.

In later experiments made in the Office of Experiment Stations it was found that in some cases, notably in that of making quick-process breads out of yellow corn meal, pouring the meal into hot water was insufficient. In these cases it seems necessary to hold the dish of moist meal over the fire for a few seconds.

When convenience, as well as the final results, was taken into consideration, it was found best in almost every case to mix the meal with cold water and to heat it thoroughly over boiling water in a double boiler. Except when very finely ground meals were used, it was found unnecessary to stir at any time, not even when the meal and water were put into the boiler. The conclusion was reached, in fact, that in all cases, even those in which the liquid used was not water, but either sweet or sour milk, the best results were obtained by heating the meal and liquid together in a double boiler without stirring. For example, sour-milk corn bread, the recipe for which is given on page 17, was prepared first according to the directions usually given in the cookbooks, i. e., by mixing the dry ingredients and then adding the sour milk, butter, and eggs. Then, for the sake of comparison, the same ingredients were combined by heating all of them but the soda and eggs for 10 or 15 minutes in the double boiler. After the mixture had cooled, the soda, dissolved in a little water, and the eggs were added. The bread prepared by this second method had a better flavor, and, though more moist than that prepared by the first method, held its shape quite as well.

Since the composition of the new-process meal differs from that of the old-process meal in having less fat as well as less water, it is desirable to make allowance for this when using the new meal. In making such simple dishes as hoeecake and corn-meal pone, which originally were prepared from the meal and water alone, a little lard or butter should be added and in other dishes the allowance of fat should be slightly increased.

CORN-MEAL MUSH AND SIMILAR DISHES.

In making corn-meal mush, or "hasty pudding," with water, allow three and one-half times as much liquid as meal; if milk is used, allow four or more times as much as of meal. Recipes for making this dish almost invariably direct that the meal be poured into boiling water, either in dry form or mixed with cold water or milk. Directions for preparing the corresponding Italian dish—polenta—often state that

the mixture should be constantly stirred, and sometimes include the most careful and minute instructions about the character of the dish and spoon to be used, and other details. The fact is that these precautions are seldom necessary, for if corn meal and cold water are brought together without being stirred and the mixture is heated gradually and gently it does not lump. The most convenient utensil for the purpose is a double boiler, but the cooking can be done satisfactorily over the fire, providing the temperature is kept low. The elaborate directions usually given in the cookbooks appear to be quite unnecessary, and there seems to be no reason for running the risk of making the porridge lumpy by pouring the meal into hot water. Nor is there any reason for having the mush stick to the dish and thus complicate the work of dish washing, as it does when the meal is cooked for a long time in a dish without water under it. If cooking over hot water is not thought to insure sterilization of the meal, the mush can be boiled after it has been cooked in the double boiler for a short time and the danger of lumping has passed.

The method of making corn-meal mush has been described above. There are many ways of using it besides serving it with milk or cream. It is often eaten with maple sirup, molasses, or other sirup, or with honey and butter. It may be fried and used alone or as an accompaniment of other dishes. A number of recipes for preparing corn meal and using it in the preparation of other dishes follow:

CORN-MEAL MUSH.

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|------------------|--------------------------------|
| 1 cup corn meal. | 3½ cups water or |
| 1 teaspoon salt. | 4 cups milk or milk and water. |

Put all the ingredients into a double boiler and cook for 4 hours.

CORN-MEAL MUSH MADE IN A FIRELESS COOKER.

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|------------------|---|
| 1 cup meal. | 4½ cups water, milk, or milk and water. |
| 1 teaspoon salt. | |

Mix the ingredients and bring them to the boiling point. Place the pail in the cooker and leave for from 5 to 10 hours. If the pail holding the mush is set into another pail of hot water before being placed in the cooker, the heat will be retained better, but whether this is necessary or not depends on the efficiency of the cooker.

Because of the long cooking which corn meal requires, it is often convenient to prepare it in a fireless cooker. It is, in fact, peculiarly adapted for this method of preparation, for, like all finely divided foods which are cooked in water, it can easily be brought to a uniformly high temperature, and there is no danger, as there is in cooking large pieces of meat, for example, that some parts will be cool when the food is put into the cooker. The large amount of water with which it is combined is also of advantage, for water has a very

high specific heat, and for this reason cools off comparatively slowly. In cooking corn meal in the fireless cooker, 5 hours at least should be allowed.

POLENTA.

This dish, which is common in Italy, differs little, except in name, from hasty pudding, though it is served in very different ways. Sometimes cheese is added during the cooking. Polenta is often reheated either with tomato sauce, or a meat gravy left over from a meal or with a meat gravy made from a small amount of meat bought for the purpose, or with half tomato sauce and half meat gravy. In any case, the dish is improved by sprinkling each layer of polenta with cheese. When the polenta is to be reheated in gravy, it is well to cut it into small pieces in order that the gravy may be well distributed through the dish.

SAUCES FOR POLENTA.

TOMATO SAUCE.

2 tablespoons butter.
2 tablespoons flour.

1 cup thick strained tomato juice.
Salt and pepper.

Melt the butter; cook the flour thoroughly in it; add the tomato juice and seasonings; and cook until smooth, stirring constantly.

SAVORY SAUCE.

Take 2 ounces of salt pork, bacon, or sausage. If bacon or pork is used, cut it into small pieces. Heat until crisp but not burned. In the fat which tries out of the meat, cook a small amount of finely chopped onion and red or green pepper, being careful not to burn them. Add 1 cup of thick tomato juice or a larger amount of uncooked juice, and cook the mixture until it is reduced to a smaller amount. Season with salt. To this sauce capers, mushrooms, or finely chopped pickle may be added.

FRIED CORN-MEAL MUSH.

The custom of packing hasty pudding in granite pans, cutting it into slices, and frying it, is too common to call for special mention here. A less common method in this country is that employed in Italy where polenta is usually spread out in thin layers on a board and cut into small blocks. These blocks are egged and crumbed, and fried in deep fat. Another method is to mix corn meal in three times its volume of water and to cook it in water only long enough to form a mush, and to complete the cooking by frying the meal in butter or other fat. This is not so stiff as ordinary fried corn-meal mush, and has the advantage of requiring a shorter time for its preparation, as the temperature of fat suitable for frying is far greater than that of boiling water.

ROAST PORK OR FRIED CHICKEN WITH CORN-MEAL MUSH.

Blocks of fried corn-meal mush are sometimes served with roast pork, and are a common accompaniment of fried chicken, particularly in the Southern States. The mush is made by the usual method, is cooled and cut into slices, and fried a delicate brown either in a greased pan or in deep fat.

For a boiled corn meal and apple dumpling to be eaten with roast pork, see page 23.

ROAST PORK WITH BATTER PUDDING.

A dish corresponding to the Yorkshire pudding which is frequently served with roast beef can be made out of corn meal to serve with roast pork.

One-fourth cup corn meal.
1 cup milk.

One-half teaspoon salt.
2 eggs.

Place the milk, corn meal, and salt in the top of a double boiler and cook them about 10 minutes, or until the meal has expanded to form a homogeneous mixture. After the mixture has cooled, add the eggs well beaten. Grease gem tins thoroughly, allowing to each about 1 teaspoon of fat from the roast pork. Bake in a moderate oven, basting occasionally with the drippings of the pork.

CORN-MEAL MUSH WITH FRUIT.

Corn-meal mush is often served with dried fruits, particularly with figs and dates. In preparing such fruit for use with the mush, it is usually necessary to soften it. This can easily be accomplished by washing the fruit and then heating it in a slow oven. As a result of the heat the water remaining on the fruit is absorbed and the fruit softened and also dried on the surface.

CORN-MEAL MUSH WITH CHEESE.

For this dish yellow corn meal is usually used. For a mush made with 1 cup of yellow corn meal the usual allowance is one-half cup, or 2 ounces, of grated cheese. There is, however, no limit to the amount of cheese which can be added, and the addition of the cheese tends not only to make a more highly nitrogenous and nourishing dish, but also to make a dish which can be eaten without the addition of butter or cream. Like the ordinary corn-meal mush, it is often fried either in deep fat, after having been egged and crumbed, or in a small amount of fat.

BUTTERMILK CORN-MEAL MUSH.

White corn meal cooked in buttermilk makes a dish which resembles cottage cheese in flavor. It may be eaten hot, but is especially palatable when served very cold with cream. For this purpose it is sometimes molded in cups. In making it, allow 1 part of corn meal to 6 parts of buttermilk, and 1 teaspoon of salt to each cup of meal.

BAKED CORN-MEAL MUSH.

When corn-meal mush is partly done pour it into shallow pans, making a layer not more than 2 inches thick, and cook in an oven until it is well browned. The product secured is very similar to the original "Johnny cake," which seems to have been simply a corn-meal mush cooked in the oven, or, in some localities, fried. The name, however has with time come to be applied to a very large variety of corn breads.

CORN-MEAL DUMPLINGS

2 cups corn meal.
1 teaspoon salt.

Boiling water.
Flour for dredging.

Mix the meal and salt; pour boiling water over the meal and stir thoroughly, using water enough to make a thick paste. Form portions of the paste into flat dumplings about 3 inches in diameter. Have ready a kettle of boiling water and drop the dumplings in carefully, cover, and cook 20 minutes. These

dumplings are often cooked with turnip tops or other greens, with or without the addition of a ham bone or a piece of fat pork. Some cooks dredge the dumplings with flour before boiling them.

CORN MEAL AND MEAT DISHES.

There are a number of dishes made from corn meal and meat or fish in which mush is used, or which resemble mush in some particulars. Recipes for such dishes follow:

CORN-MEAL MUSH WITH PORK.

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| 1 pound lean pork, part meat
and part bone. | One-half teaspoonful powdered
sage. |
| 1 cup corn meal. | Water. |
| 1 teaspoon salt. | |

Cook the pork in water until the meat can be easily removed from the bone. Remove the meat, cool the broth, and remove the fat. Reduce the broth to about a quart, or add water enough to bring it up to this amount, and cook the corn meal in it. Add the meat finely chopped and the seasonings. Pack in granite bread tins. Cut into slices and fry. Beef may be used in the same way.

CORN-MEAL SCRAPPLE.

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|-------------------------------|----------------|
| 1 pig's head split in halves. | Salt and sage. |
| 2 cups corn meal. | |

Follow the above directions for cooking corn meal with pork, but use double the amount of water.

CORN-MEAL FISH BALLS.

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|--------------------------------------|--------------------------------|
| 2 cups cold white corn meal
mush. | 1 egg.
1 tablespoon butter. |
| 1 cup shredded codfish. | |

Pick over the codfish and soak it to remove salt, if necessary. Combine the ingredients and drop by spoonfuls into hot fat. Drain on porous paper. These codfish balls compare very favorably in taste with those made with potato and are more easily and quickly prepared.

CHICKEN AND CORN-MEAL CROQUETTES.

- | | |
|-----------------------------|------------------|
| 1 cup white corn meal mush. | 1 egg. |
| 1 cup chopped chicken. | Salt and pepper. |
| Few drops onion juice. | |

Combine the ingredients and drop by spoonfuls into hot fat.

White corn meal may be very satisfactorily combined with other kinds of cold meat to make croquettes. In general, corn-meal croquettes need not be egged and crumbed like ordinary croquettes, for the hardening of the corn meal on the surface of the mixture forms the necessary crust.

TAMALES.

Meat from $\frac{1}{2}$ boiled chicken.	1 teaspoon salt.
1 clove garlic or $\frac{1}{2}$ medium-sized onion.	1 cup corn meal.
One-fourth teaspoon cayenne.	2 or 3 small red peppers.
	Corn husks.

Chop the chicken; season with the cayenne pepper, garlic, or the onion finely chopped, and salt; form the meat into little rolls about 2 inches long and three-fourth inch in diameter. Pour boiling water over the meal and stir; use water enough to make a thick paste. Take a heaping tablespoon of the paste, pat it out flat, and wrap a roll of chicken in it; then wrap each roll, as made, in corn husks which have been softened by immersion in hot water, tying the husks with a piece of string close to each end of the roll. Trim off the ends of the corn husks, allowing them to project an inch or two beyond the rolls. Cover the rolls with the broth in which the chicken was cooked, or with boiling salted water. Add two or three small, sharp, red peppers, and boil for 15 minutes.

Tamales are usually made with chicken but other meat may be used if desired.

CORN-MEAL BREAD.

It is difficult, if not impossible, to make a good yeast bread out of corn meal alone. In order to understand the problems involved, it is necessary to know something about the protein, particularly how it differs from the protein of other cereals commonly used in the preparation of yeast bread. It should be remembered that the word "protein" is not used to designate any one substance of unvarying characteristics, but is applied to mixtures of many nitrogenous substances which are found in almost every natural food product. It is possible, therefore, for the protein of two food materials, corn and wheat for example, to be the same in quantity, but to differ widely in quality.

The chief proteid of wheat, "gluten," is a mixture of substances which, when combined with water, makes a peculiarly sticky and tenacious mass that tends to hold any gas which is introduced into it. It is because of the presence of gluten that it is possible to make a porous loaf out of wheat and water.

The protein of corn, on the other hand, is totally lacking in the quality of tenacity, and so the somewhat granular particles of meal tend to separate readily. While this is an advantage in the preparation of some dishes, as stated above, it is a disadvantage in others, for any gas which is introduced into the moist meal escapes easily without rendering the mass porous. In fact, if eggs are not used with the meal, a certain amount of flour must be introduced if the bread is to be light and porous. The early settlers of this country discovered the advantage of adding rye to the corn, which helped to keep the bread moist, as well as to hold the gas bubbles due to the growth of the yeast. Ordinary wheat flour is very commonly used for this purpose with corn for bread making, but in tests which

were made in preparing this bulletin the best results were obtained with gluten flour, which is made from wheat by removing a certain amount of starch, and in which the percentage of gluten is high. Gluten flours differ in composition depending upon the amount of starch which has been removed. To really warrant the name "gluten flour" the protein content should be at least 35 per cent, as prescribed in the Standards of Purity for Food Products.¹ The flour with which experiments were made in this laboratory contained about 30 per cent of protein as compared with 12 to 14 per cent in ordinary wheat flour. It cost 14 cents a pound, and the combination of three parts of corn meal, which was at that time $3\frac{1}{2}$ cents a pound, with one part of gluten flour, made a mixture which averaged 6 cents a pound, a little more than the price per pound of wheat flour at that time. Samples of bread made from this mixture were analyzed and their protein content was found to average about 10 per cent as compared with 9 per cent usually found in wheat bread. It was of good color and flavor.

Even those breads which are made by combining corn meal with gluten or rye flour can not be handled like the breads made from wheat flour. The process is, in fact, very much shorter. The dough is placed in the pan immediately after being mixed and molded and should be baked as soon as the loaf is fully risen. The shape of the pan, too, is important, for it must have high sides, which will support the loaf after it has risen to its full height.

F. P. Dunnington,² in a report of a study of "The grinding of corn meal for bread," gives the data of experiments in preparing the simplest forms of corn bread, those consisting either of meal, salt, and water only, or those consisting of these ingredients with a little fat. He tested a large number of samples secured from mills in many parts of the country, North as well as South, and reported that the inferiority of some meals, as compared with others, for the purpose of preparing the kinds of bread with which he was experimenting, was due to the fact that they were too finely divided. He recommends that when meal is too fine to make light bread of this sort a small amount of baking powder be added.

Corn-meal breads, though of great variety, when the agencies by which they are made light are considered, fall into three classes: Those raised by air beaten into them, those raised by baking powder or soda, and those raised by yeast. The granular character of the meal favors the making of the first kind, for, as we have seen, there is nothing corresponding with the gluten of wheat to hold the particles together and to prevent them from being driven apart by the

¹ U. S. Dept. Agr., Office Secretary Circ. 19.

² Orig. Commun. 8. Internat. Cong. Appl. Chem. [Washington and New York], 18 (1912), Sect. VIIIc, pp. 119-127.

expansion of the air. Such breads are best made from the coarser meals and are usually very simple in character, often containing nothing more than meal, salt, and either water or milk. A small amount of fat is, however, sometimes added. They are light in texture but not porous. In breads of the second class, which are made light by the carbon dioxid given off by baking powder, or through the action of sour milk on soda, the gluten deficiency of the corn is made up for by the use of eggs, which hold the air bubbles which make it light. In breads of the third class, those raised by the carbon dioxid given off by the yeast, the gluten deficiency in the corn is supplied by the addition of some other flour, usually wheat or rye. Yeast-raised corn breads do not dry out nearly so quickly as the other types and they are palatable either warm or cold. For these reasons they are convenient for the housekeeper who does not wish to make bread fresh for each meal.

In the pages which follow recipes are given for breads of each class. The simpler breads, like ash cake and hoecake, are very old types closely resembling the bread of primitive people, and such corn breads were made by the Indians. Though easy to prepare, they are nevertheless very palatable.

ASH CAKE.

1 quart corn meal.
2 teaspoons salt.

1 tablespoon lard or other
shortening.
Boiling water.

Scald the meal; add the salt and shortening, and when the mixture is cool form it into oblong cakes, adding more water if necessary. Wrap the cakes in cabbage leaves, or place one cabbage leaf under the cakes and one over them, and cover them with hot ashes.

HOECAKE.

Hoecakes are made out of corn meal, water, and salt. They were originally baked before an open fire on a board which for convenience had a long handle attached to it. At present they are cooked slowly and on both sides on a well-greased griddle.

CORN DODGER.

The corn dodger is like the hoecake except it usually contains a small amount of butter or lard. The meal is scalded and when cool is formed into cakes and cooked in a hot oven.

CRACKLING BREAD.

1 quart corn meal.
1 pint cracklings.

2 teaspoons salt.
Boiling water.

Mix the corn meal and salt; pour over this mixture enough boiling water to moisten but not enough to make a mush. When the meal has cooled, work the cracklings into it with the fingers. Form the dough into cakes about 4 inches long, 2 inches wide, and 1 inch thick; bake for 30 minutes. This bread, because of its large percentage of fat, is eaten without butter, and should be served very hot.

"Cracklings," like "scraps," is a name given to the crisp, brown meat tissue left after lard is "tried out." Cracklings consist of connective tissue with a

large amount of fat adhering to it. Much of the fat can be removed by pressure. This is best done by squeezing them in a thin cloth while they are still warm or after they have been reheated.

CRISP CORN-MEAL CAKE.

1 cup milk.	One-half teaspoon salt.
One-half cup white corn meal,	

Mix the ingredients and heat slowly until the boiling point is reached. It is not necessary to stir. Spread on a shallow buttered pan to a depth of about one-fourth of an inch. Bake in a moderate oven until crisp.

PARCHED CORN-MEAL BISCUITS.

1 cup yellow corn meal.	2 cups peanut cream.
2 teaspoons salt.	

Put the meal into a shallow pan and heat in the oven until it is a delicate brown, stirring frequently. Make the nut cream by mixing peanut butter with cold water and heating. It should be the consistency of thick cream. While the nut cream is hot, stir in the corn meal, which should also be hot. Beat thoroughly. The mixture should be of such consistency that it can be dropped from a spoon. Bake in small cakes on a greased pan.

If preferred, these biscuits may be made with cream or with butter in place of peanut cream, and chopped raisins may be added, 1 cup being the allowance for the quantities given above.

BEATEN CORN BREAD.

Three-fourths cup white corn meal.	One-half teaspoon salt.
Three-fourths cup wheat flour.	1 tablespoon lard.
1 teaspoon sugar.	Water.

Mix and sift the dry ingredients and rub the lard thoroughly into the mixture by means of a fork. Add a little water, enough to moisten the mixture through out, but not too much, as it must be crumbly. Spread on a board and beat thoroughly with a rolling pin or mallet, as is done with beaten biscuits, folding it over frequently to introduce air. Roll out about one-half inch thick, cut into small pieces, and bake in a moderate oven. In camp this can be baked in a hot greased pan propped up before a hot fire.

SOUP-MILK CORN BREAD.

2 cups corn meal.	1½ teaspoons salt.
2 cups sour milk.	2 eggs.
2 tablespoons butter.	1 teaspoon soda.
2 tablespoons sugar, white or brown.	1 tablespoon cold water.

There are two ways of mixing this bread. By the first the meal, milk, salt, butter, and sugar are cooked in a double boiler for about 10 minutes. When the mixture is cool, the eggs are added well beaten and the soda dissolved in the water. By the other method all the dry ingredients, including the soda, are mixed together, and then the sour milk and eggs well beaten and the butter are added. If the second method is followed, the cold water is not needed. The bread should be baked in a shallow iron or granite pan for about 30 minutes.

Since the bread made by the first method is of much better texture, that method is to be preferred, except in cases where there is not time for the necessary heating and cooling of the meal.

Buttermilk may be substituted for the sour milk, in which case the butter should be slightly increased; or sour cream may be used and the butter omitted.

SPIDER CORN BREAD.

1½ cups corn meal.	1 teaspoon salt.
2 cups sour milk.	2 eggs.
1 teaspoon soda.	2 tablespoons butter.

Mix the dry ingredients. Add the eggs well beaten and the milk. Place the butter in a frying pan, melt it, and grease the pan well. Heat the pan and turn in the mixture. Place in a hot oven and cook 20 minutes.

ZUÑI INDIAN BREAD.

1 cup white corn meal.	1 teaspoon salt.
1 cup yellow corn meal.	One-eighth teaspoon cayenne.
1 cup water.	1 cup chopped suet.

Mix all well together; form into rolls about 5 inches long; roll in greased paper; and bake in a moderate oven 1 hour. Serve hot.

The habit among the Indians was to roll these cakes in the husks of the corn, a method which is sometimes followed by campers.

CORN-MEAL MUFFINS.

One-half cup corn meal.	1 tablespoon melted butter.
1 cup flour.	1 teaspoon salt.
3 teaspoons baking powder.	Three-fourths cup milk.
2 tablespoons sugar.	1 egg.

Mix and sift the dry ingredients; add the milk gradually, the egg well beaten, and the melted butter; bake in a hot oven in buttered gem pans 25 minutes.

CORN MUFFINS WITH DATES.

1 cup white corn meal.	1 cup wheat flour.
2 tablespoons brown sugar.	4 teaspoons baking powder.
1 teaspoon salt.	1 egg.
2 tablespoons butter.	One-half cup dates cut into small pieces.
1½ cups milk.	

Cook together the first 5 ingredients for 10 minutes in a double boiler. When cool, add the eggs, the dates, and the flour sifted with the baking powder. Beat thoroughly and bake in muffin pans in a quick oven, or bake in a loaf. The bread will keep in good condition longer if the dates are cooked with the corn meal and other ingredients in the double boiler.

CUSTARD CORN CAKE.

2 eggs.	1 cup sweet milk.
One-fourth cup sugar.	1½ cups corn meal.
1 teaspoon soda.	One-third cup wheat flour.
1 teaspoon salt.	2 tablespoons butter.
1 cup sour milk.	1 cup cream.

Beat the eggs and sugar together thoroughly. Sift the flour, soda, and salt together and mix with the meal. Mix all the ingredients but the cream and butter. Melt the butter in a deep pan, using plenty on the sides. Pour in the batter, add (without stirring) a cup of cream, and bake 20 to 30 minutes.

When cooked there should be a layer of custard on top of the cake or small bits of custard distributed through it.

CORN-MEAL ROLLS.

1 $\frac{1}{4}$ cups wheat flour.	1 egg.
Three-fourths cup corn meal.	One-half cup milk.
3 teaspoons baking powder.	1 teaspoon salt.
2 tablespoons butter.	

Sift together the flour, baking powder, and salt, and mix with the meal. Rub the butter into the dry ingredients. Beat the egg, add the milk, and add this mixture to the dry ingredients. Add more milk if necessary to make a soft dough. Roll out on a floured board, handling lightly. Cut with a round biscuit cutter, fold like Parker House rolls, and bake in a quick oven.

SOFT CORN BREAD.

Two-thirds cup rice.	2 or 3 eggs.
One-half cup white corn meal.	2 tablespoons butter.
3 cups milk or milk and water mixed.	1 teaspoon salt.

Mix the rice, meal, and salt with the milk in the top of a double boiler, and cook until the rice is nearly soft. Add the butter and the eggs well beaten and transfer to a greased granite baking pan. Bake in a moderate oven for an hour. Serve in the dish in which it is baked.

SPOON CORN BREAD.

2 cups water.	1 tablespoon butter.
1 cup milk.	2 eggs.
1 cup white corn meal.	2 teaspoons salt.

Mix the water and the corn meal and bring slowly to the boiling point and cook 5 minutes. Add the eggs well beaten and the other ingredients. Beat thoroughly and bake in a well-greased pan for 25 minutes in a hot oven. Serve from the same dish with a spoon.

DELICATE SPOON CORN BREAD.

One-fourth cup corn meal.	1 teaspoon salt.
1 teaspoon butter.	2 eggs.
1 tablespoon sugar.	2 cups milk.

Mix the corn meal and water and bring slowly to the boiling point and cook a few minutes. Add the butter, sugar, salt, and yolks of eggs. Lastly, fold in the whites of eggs beaten stiff. Bake in a hot oven 30 minutes. Serve in the dish in which it is cooked.

CORN MEAL AND HOMINY BREAD.

1 cup cooked hominy.	1 cup white corn meal.
1 cup milk.	2 eggs.
1 tablespoon melted butter.	1 $\frac{1}{2}$ teaspoons salt.

Mix the ingredients and bake 30 minutes in a moderate oven.

STEAMED CORN-MEAL BREAD.

2 cups yellow meal.	1 $\frac{1}{2}$ teaspoons soda.
1 cup flour.	1 teaspoon salt.
2 $\frac{1}{4}$ cups sour milk.	One-half cup molasses.

Sift together the flour, soda, and salt, and stir in the corn meal, mixing thoroughly. Add the molasses and sour milk. Pour into a well-buttered mold, which

should not be more than two-thirds full. A lard pail is a good substitute for the mold. Cover closely and steam 5 hours.

BOSTON BROWN BREAD.

1 cup corn meal.	1 teaspoon salt.
1 cup rye meal.	Three-fourths cup molasses.
1 cup Graham flour.	2 cups sour milk, or
2½ teaspoons soda.	1¼ cups sweet milk.

Mix and sift the dry ingredients and add the molasses and milk. Beat thoroughly and steam 3½ hours in well-buttered, covered molds. Remove the covers and bake the bread long enough to dry the top.

This may be made also with 1½ cups corn meal and rye meal and no Graham flour.

BOSTON BROWN BREAD WITH FRUIT.

Follow recipe for Boston brown bread, adding to the dry ingredients a cup of seeded and shredded raisins or prunes or a cup of Zante currants.

BOSTON BROWN BREAD WITH CREAM.

1 cup rye meal.	One-half cup molasses.
1 cup corn meal.	2 eggs.
1 teaspoon salt.	1½ cups thin cream.

Sift the dry ingredients. Add molasses, yolks of eggs well beaten, and cream; lastly, fold in the whites of eggs beaten stiff. Pour mixture into buttered mold, steam 3 hours; then bake 1 hour in a moderate oven.

INDIAN MEAL BREAD.

1½ cups Graham flour.	1 teaspoon salt.
1 cup corn meal.	One-half cup molasses.
One-half tablespoon soda.	1½ cups milk.

Mix and steam as Boston brown bread.

APPLE CORN BREAD.

2 cups white corn meal.	1 teaspoon cream of tartar.
2 tablespoons sugar.	1½ cups milk.
One-half teaspoon salt.	3 tart apples pared and sliced.
1 teaspoon soda.	

Mix the dry ingredients, add milk, and beat thoroughly. Add the apples. Pour into a well-buttered shallow pan and bake 30 minutes in hot oven.

SOUTH CAROLINA CORN BREAD.

1½ quarts fine corn meal.	2 teaspoons salt.
2½ quarts wheat flour.	1 pint mashed sweet potatoes.
or	1 cake yeast.
2½ quarts fine corn meal.	
1½ quarts wheat flour.	

Mix 1 pint each of the corn meal and the flour and add warm water enough to form a stiff batter. Add the yeast cake, mixed with a small amount of water. Keep this sponge in a warm place until it becomes light. Scald the meal with boiling water and as soon as it is cool enough add it to the sponge

with the flour, potatoes, and salt. The dough should be just thick enough to knead without danger of its sticking to the board. Experience will teach how much water to use to secure this end. Knead well and put in a warm place to rise. When it is light, form into loaves, put into bread pans, and let it rise until its volume is doubled. Bake in a moderate oven.

It was a common, though not general, practice in New England to add cooked pumpkin to the other ingredients in making such bread as this, very much as sweet potato is used in the South. The sweet potato or pumpkin changes the flavor of the bread somewhat and apparently facilitates the rising of the dough, improves the texture of the bread, and tends to keep it moist. However, if sweet potato or pumpkin, either home cooked or canned, can not be conveniently obtained, good bread can be made without it.

GLUTEN AND CORN BREAD.

2½ cups yellow or white corn meal.	One-half yeast cake (or 1 cake, if haste is an object) dissolved in one-fourth cup lukewarm water.
Three-fourths cup gluten, rye, or wheat flour (preference being in order named).	2 tablespoons butter, lard, or a mixture of the two.
1½ cups boiling water.	3 teaspoons salt.
1 tablespoon sugar.	

Pour the corn meal into a dish of boiling water. It is not sufficient merely to pour the boiling water over the meal in a cold dish. If yellow meal is used, heat it a little in addition to pouring it into the boiling water, or mix meal and water and heat in a double boiler. When cool mix with the other ingredients and knead thoroughly. Place in a baking tin, and bake when risen sufficiently.

THIRD BREAD.

2 quarts yellow corn meal.	One-half cup molasses.
2 teaspoons salt.	1 quart rye flour
Boiling water.	1 yeast cake.

Mix the corn meal and salt and pour over them enough boiling water to moisten the mixture but not to make a batter. When cool add the molasses and the yeast mixed with a little water. Add the rye flour to the corn-meal mixture, gradually alternating it, if necessary, with lukewarm water in order to keep the dough thin enough to be stirred with a spoon. Let it rise until light, form into a loaf, and bake in a slow oven four or five hours.

CORN-MEAL PUFFS, GRIDDLECAKES, AND WAFFLES.

The peculiar granular consistency of corn meal, which is a disadvantage under some circumstances, is an advantage in making griddlecakes or waffles, for it renders them very tender.

CORN-MEAL PUFFS.

1 quart milk.	1 teaspoon salt.
Two-thirds cup corn meal.	8 eggs.
One-fourth cup sugar.	Grated nutmeg (if desired).

Cook the milk and meal together 15 minutes with the salt and sugar. When cool add the eggs well beaten. Bake in cups. Serve with stewed fruit or jam.

CORN-MEAL FRITTERS.

By increasing the corn meal in the above recipe by half (i. e., to 1 cup) the batter is made stiff enough to be dropped into hot fat and fried.

CORN-MEAL PANCAKES.

2 cups flour.	One-third cup sugar.
One-half cup corn meal.	1½ cups boiling water.
1½ tablespoons baking powder.	1¼ cups milk.
1½ teaspoons salt.	1 egg.

Add meal to boiling water and boil 5 minutes; turn into bowl, add milk and remaining dry ingredients mixed and sifted, then the egg well beaten, and butter. Cook on a greased griddle.

CORN MEAL AND WHEAT WAFFLES.

1½ cups water.	1¼ tablespoons baking powder.
One-half cup white corn meal.	1½ teaspoons salt.
1½ cups milk.	Yolks 2 eggs.
3 cups flour.	Whites 2 eggs.
3 tablespoons sugar.	2 tablespoons melted butter.

Cook the meal in boiling water 20 minutes; add milk, dry ingredients mixed and sifted, yolks of eggs well beaten, butter and whites of eggs beaten stiff. Cook on a greased waffle iron.

CORN MEAL AND RICE WAFFLES.

One-half cup corn meal.	1 tablespoon melted butter.
One-half cup flour.	One-half teaspoon soda.
1 cup boiled rice.	1 teaspoon salt.
2 eggs well beaten.	1 cup sour milk.

Sift together the flour, soda, and salt. Add the other ingredients and beat thoroughly.

BUTTERMILK WAFFLES.

3 cups water.	2 tablespoons butter.
2 cups corn meal.	2 teaspoons salt.
2 cups wheat flour.	1½ teaspoons soda.
1 cup sweet milk.	Buttermilk or sour milk enough
4 eggs.	to make a thin batter.

Cook the meal, water, salt, and butter together in a double boiler for 10 minutes. When the mush is cool add the eggs, beaten separately until very light. Sift the flour and soda together. Add the flour and the sweet milk alternately to the corn mixture. Finally add the buttermilk. This mixture is improved by standing a short time.

CORN-MEAL PUDDINGS.

There is a large variety of popular and very nutritious puddings made chiefly out of milk, to which a small amount of some starchy substance has been added. The substance most frequently used is probably rice, but corn meal too has always been commonly used.

The proportion of cereal to milk is always as low as 1 to 12, and sometimes as low as 1 to 16; i. e., one-fourth to one-third cup of cereal to 3 or 4 cups of milk. The only other ingredients are sugar or molasses and some flavoring material. Other puddings are made by combining corn meal with milk and eggs.

INDIAN PUDDING.

5 cups milk.	1 teaspoon salt.
One-third cup corn meal.	1 teaspoon ginger.
One-half cup molasses.	

Cook milk and meal in a double boiler 20 minutes; add molasses, salt, and ginger; pour into buttered pudding dish and bake 2 hours in slow oven; serve with cream.

CORN MEAL AND FIG PUDDING.

1 cup corn meal.	1 cup finely chopped figs.
1 cup molasses.	2 eggs.
6 cups milk (or 4 of milk and 2 of cream).	1 teaspoon salt.

Cook the corn meal with 4 cups of the milk, add the figs and salt. When the mixture is cool, add the eggs well beaten. Pour into a buttered pudding dish and bake in a moderate oven for 3 hours or more. When partly cooked add the remainder of the milk without stirring the pudding.

CORN MEAL AND APPLE PUDDING.

For the figs in the above recipe substitute a pint of finely sliced or chopped sweet apples.

BOILED CORN MEAL AND APPLE DUMPLING.

6 tart apples, medium-sized.	2 cups corn meal.
1 teaspoon salt.	Boiling water.

Pour boiling water over the corn meal, to which the salt has been added, using enough water to make a thick paste; stir thoroughly; with the hands flatten out the paste until it is about 1 inch thick and wrap it around the apples, which have been pared, cored, and quartered. Inclose in a pudding cloth and cook in boiling salted water. If preferred, the pudding may be put in a bowl, covered with a plate, and steamed.

This is an old-fashioned dish which was commonly served as an accompaniment to roast pork.

This pudding may be used as a dessert by cutting it open before serving, scattering sugar and bits of butter over it and then a little cinnamon or grated nutmeg. Cream or any of the usual pudding sauces may be served with it if desired.

CORN-MEAL CAKES.

It is often possible to substitute corn meal for part of the flour in making cakes. In some of the cases given here, in making gingerbread, for example, there is no special advantage in using it, but it is

well to know that it can be used in emergencies. In making doughnuts, however, there is a decided advantage in substituting corn meal for part of the flour, for doughnuts so made are much more likely to be tender than those made with wheat flour alone.

INDIAN-MEAL DOUGHNUTS.

Three-fourths cup milk.	Three-fourths cup sugar.
1½ cups very fine white corn meal.	2 eggs well beaten.
1¼ cups wheat flour.	1 teaspoon cinnamon.
One-fourth cup butter.	2 teaspoons baking powder.
	1 level teaspoon salt.

Put milk and meal into a double boiler and heat together for about 10 minutes. Add the butter and sugar to the meal. Sift together the wheat flour, baking powder, cinnamon, and salt. Add these and the eggs to the meal. Roll out on a well-floured board; cut into the desired shapes; fry in deep fat; drain and roll in powdered sugar.

MOLASSES CORN CAKE.

2 cups yellow corn meal.	1 cup sour milk.
One-half cup molasses.	1 cup sweet milk.
One-half cup sugar.	1 cup wheat flour.
2 tablespoons butter.	1½ teaspoons soda.
1 teaspoon salt.	1 egg.

Mix the first seven ingredients in a double boiler and cook over hot water. Cook for about 10 minutes after the mixture has become hot. After it has cooled add the wheat flour and soda, thoroughly sifted together, and the egg well beaten. Bake in a shallow tin.

CORN-MEAL GINGERBREAD.

To the above recipe add one-half teaspoon ginger, 1 teaspoon cinnamon, and one-half teaspoon cloves, sifting them with the flour.

CORN-MEAL AND ORANGE GINGERBREAD.

To the recipe for gingerbread given above add the grated rind of an orange or one-half cup of orange marmalade. If the latter is added, the amount of milk and of sugar should both be slightly reduced.

FRUIT GEMS.

1 cup corn meal.	One-half cup raisins.
1 cup milk.	One-half cup Zante currants.
1 teaspoon salt.	One-half cup cream.
1 teaspoon baking powder.	

Cook the meal and salt in the milk for a few minutes. When cool add the baking powder and beat thoroughly. Add the fruit and cream and bake in well-buttered muffin tins.